

CLAIM SET AS AMENDED

1. (Currently Amended) A solenoid comprising:

an excitation coil;

a slider disposed in a central part of the excitation coil; and

a yoke including a first yoke part that covers one end surface of the excitation coil and has a facing surface that faces an outer circumferential surface of the slider, a second yoke part that covers another end surface of the excitation coil and has a facing surface that faces the outer circumferential surface of the slider, and a linking part that links the first yoke and the second yoke and covers an outer circumferential part of the coil, the yoke forming a closed magnetic path together with the slider,

wherein a bearing is ~~sandwiched between~~ fitted in both end sections of the first yoke part and the second yoke part including the facing surfaces, is disposed on an outer circumference of the slider, and guides the slider in a movable state, the bearing being made of a nonmagnetic body,

n (where n is a positive integer of 0 or higher) grooves, which are provided so as to be concave around an inner circumference, and n+1 tooth parts, which are adjacent to the grooves and function as magnetic poles, are provided in the facing surface of the first yoke part,

m (where m is a positive integer of 0 or higher) grooves, which are provided so as to be concave around an inner circumference and m+1 tooth parts, which are adjacent to the

grooves and function as magnetic poles, are provided in the facing surface of the second yoke part,

$n+1$ grooves, which are provided so as to be concave around an outer circumference, and $n+1$ tooth parts, which are adjacent to the grooves and function as magnetic poles, are provided in a surface of the slider that faces the first yoke part, and m grooves, which are provided so as to be concave around an outer circumference, and

m tooth parts, which are adjacent to the grooves and function as magnetic poles, are provided in a surface of the slider that faces the second yoke part.

2. (Original) A solenoid according to Claim 1, wherein the facing surfaces formed on the first yoke part and the second yoke part have a same internal diameter.

3. (Original) A solenoid according to Claim 1, wherein the grooves and the tooth parts are formed so as to be rectangular or trapezoidal in cross-section.

4. (Original) A solenoid according to Claim 2, wherein the grooves and the tooth parts are formed so as to be rectangular or trapezoidal in cross-section.

5. (Original) A solenoid according to Claim 1, wherein a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to

the bearing in an axial direction, is formed at a position that does not contact the bearing in a range where the slider moves.

6. (Original) A solenoid according to Claim 2, wherein a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, is formed at a position that does not contact the bearing in a range i where the slider moves.

7. (Original) A solenoid according to Claim 3, wherein a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, is formed at a position that does not contact the bearing in a range where the slider moves.

8. (Original) A solenoid according to Claim 4, wherein a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, is formed at a position that does not contact the bearing in a range where the slider moves.

9. (Currently Amended) A solenoid ~~according to Claim 1, comprising:~~
an excitation coil;
a slider disposed in a central part of the excitation coil; and

a yoke including a first yoke part that covers one end surface of the excitation coil and has a facing surface that faces an outer circumferential surface of the slider, a second yoke part that covers another end surface of the excitation coil and has a facing surface that faces the outer circumferential surface of the slider, and a linking part that links the first yoke and the second yoke and covers an outer circumferential part of the coil, the yoke forming a closed magnetic path together with the slider,

wherein a bearing is sandwiched between the first yoke part and the second yoke part, is disposed on an outer circumference of the slider, and guides the slider in a movable state, the bearing being made of a nonmagnetic body,

n (where n is a positive integer of 0 or higher) grooves, which are provided so as to be concave around an inner circumference, and n+1 tooth parts, which are adjacent to the grooves and function as magnetic poles, are provided in the facing surface of the first yoke part,

m (where m is a positive integer of 0 or higher) grooves, which are provided so as to be concave around an inner circumference and m+1 tooth parts, which are adjacent to the grooves and function as magnetic poles, are provided in the facing surface of the second yoke part,

n+1 grooves, which are provided so as to be concave around an outer circumference, and n+1 tooth parts, which are adjacent to the grooves and function as magnetic poles, are provided in a surface of the slider that faces the first yoke part, and m grooves, which are provided so as to be concave around an outer circumference,

m tooth parts, which are adjacent to the grooves and function as magnetic poles, are provided in a surface of the slider that faces the second yoke part, and

wherein a recess is formed in the bearing so that a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, does not contact the bearing in a range where the slider moves.

10. (Original) A solenoid according to Claim 2, wherein a recess is formed in the bearing so that a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, does not contact the bearing in a range where the slider moves.

11. (Original) A solenoid according to Claim 3, wherein a recess is formed in the bearing so that a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, does not contact the bearing in a range where the slider moves.

12. (Original) A solenoid according to Claim 4, wherein a recess is formed in the bearing so that a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, does not contact the bearing in a range where the slider moves.

13. (Original) A solenoid according to Claim 5, wherein a recess is formed in the bearing so that a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, does not contact the bearing in a range where the slider moves.

14. (Original) A solenoid according to Claim 6, wherein a recess is formed in the bearing so that a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, does not contact the bearing in a range where the slider moves.

15. (Original) A solenoid according to Claim 7, wherein a recess is formed in the bearing so that a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, does not contact the bearing in a range where the slider moves.

16. (Original) A solenoid according to Claim 8, wherein a recess is formed in the bearing so that a part, which is an upper end edge part of the groove provided in the slider and is located on a far side with respect to the bearing in an axial direction, does not contact the bearing in a range where the slider moves.